

Application No.: 10/590,832
Filing Date: August 28, 2006

AMENDMENTS TO THE CLAIMS

1. **(Original)** A detection probe comprising:
 - an external vesicle comprising a plurality of amphiphilic molecules forming a vesicle membrane;
 - a plurality of mass tag molecules encapsulated within the vesicle, within the vesicle membrane or adsorbed on the vesicle membrane; and
 - a probe attached to the vesicle.
2. **(Currently Amended)** The detection probe of claim 1, wherein the external vesicle is ~~easily disrupted~~ disruptible by physical or chemical stimulation to release the mass tag molecules.
3. **(Original)** The detection probe of claim 1, wherein the plurality of mass tag molecules comprise at least a part of the vesicle membrane.
4. **(Original)** The detection probe of claim 1, further comprising at least one vesicle encapsulated within the external vesicle, at least a part of the external and encapsulated vesicles comprising the mass tag molecules.
5. **(Currently Amended)** The detection probe of claim 4, wherein the external and encapsulated vesicles are ~~easily disrupted~~ disruptible by physical or chemical stimulation to release the mass tag molecule.
6. **(Canceled)**
7. **(Canceled)**
8. **(Canceled)**
9. **(Canceled)**
10. **(Original)** The detection probe of claim 1, wherein the probe comprises at least one molecule selected from the group consisting of chemical residues, polynucleotides, polypeptides, and carbohydrates.
11. **(Canceled)**
12. **(Original)** The detection probe of claim 1, wherein the mass tag molecules are a biopolymer.
13. **(Canceled)**

14. (Currently Amended) The detection probe of claim 1, wherein the mass tag molecules are a synthetic polymers selected from the group consisting of block copolymers, polyethylene glycol, polyvinyl phenol, polypropylene glycol, polymethyl methacrylate, and derivatives thereof.

15. (Canceled)

16. (Currently Amended) The detection probe of claim 1, wherein the mass tag molecules are an amphiphilic molecule bound to a biopolymer or synthetic polymer.

17. (Canceled)

18. (Currently Amended) A detection probe, comprising:

a body comprising a material that can becomes soluble in a solvent upon physical or chemical stimulation and at least one mass tag molecule, wherein the solvent is selected from the group consisting of water, buffer, acid, alkali, and organic solvent; and

a probe attached to the body.

19. (Currently Amended) The detection probe of claim 18, wherein the body comprises a soluble bead.

20. (Canceled)

21. (Canceled)

22. (Original) The detection probe of claim 18, wherein the probe comprises at least one molecule selected from the group consisting of chemical residues, polynucleotides, polypeptides, and carbohydrates.

23. (Canceled)

24. (Original) The detection probe of claim 18, wherein the mass tag molecule is a biopolymer.

25. (Currently Amended) The detection probe of claim 18, wherein the mass tag molecule is a synthetic polymer selected from the group consisting of a block copolymer, polyethylene glycol, polyvinyl phenol, polypropylene glycol, polymethyl methacrylate, and derivatives thereof.

26. (Currently Amended) A set of detection probes comprising:

a first detection probe comprising:

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a first body comprising a material that ~~can~~ becomes soluble in a solvent upon physical or chemical stimulation and at least one first mass tag molecule, wherein the solvent is selected from the group consisting of water, buffer, acid, alkali, and organic solvent; and

a first probe attached to the first body; and

a second detection probe comprising:

a second body comprising a material that ~~can~~ becomes soluble in a solvent upon physical or chemical stimulation and at least one second mass tag molecule, wherein the solvent is selected from the group consisting of water, buffer, acid, alkali, and organic solvent; and

a second probe attached to the second body;

wherein the mass of the first mass tag molecule is different from the mass of the second mass tag molecule.

27. (Currently Amended) The set of detection probes of claim 26, wherein the first and second bodies comprise soluble beads.

28. (Canceled)

29. (Canceled)

30. (Original) The set of detection probes of claim 26, wherein the first and second probes comprise at least one molecule selected from the group consisting of chemical residues, polynucleotides, polypeptides, and carbohydrates.

31. (Canceled)

32. (Original) The set of detection probes of claim 26, wherein the first and second mass tag molecules are biopolymers

33. (Canceled)

34. (Original) The set of detection probes of claim 26, wherein the first and second mass tag molecules are synthetic polymers.

35. (Canceled)

36. (Original) The set of detection probes of claim 26, wherein the first and second mass tag molecules are amphiphilic molecules bound to a biopolymer or synthetic polymer.

37. (Canceled)

38. (Canceled)

39. (Canceled)

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40. (Canceled)

41. (Canceled)

42. (Canceled)

43. (Canceled)

44. (Canceled)

45. (Canceled)

46. (Canceled)

47. (Canceled)

48. (Canceled)

49. (Canceled)

50. (Canceled)

51. (Canceled)

52. (Canceled)

53. (Canceled)

54. (Canceled)

55. (Canceled)

56. (Original) A set of detection probes comprising:

a first detection probe comprising:

a first external vesicle comprising a plurality of amphiphilic molecules forming a first vesicle membrane;

a plurality of first mass tag molecules encapsulated within the first external vesicle, within the first vesicle membrane or adsorbed on the first vesicle membrane; and

a probe attached to the first external vesicle; and

a second detection probe comprising:

a second external vesicle comprising a plurality of amphiphilic molecules forming a second vesicle membrane;

a plurality of second mass tag molecules encapsulated within the second external vesicle, within the second vesicle membrane or adsorbed on the second vesicle membrane; and

a probe attached to the second external vesicle;

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wherein the mass of the first mass tag molecules is different from the mass of the second mass tag molecules.

57. **(Original)** The set of detection probes of claim 56, wherein the first and second external vesicles are easily disrupted to release the mass tag molecule.

58. **(Original)** The set of detection probes of claim 56, wherein each of the first and second mass tag molecules is encapsulated within each of the first and second external vesicles, respectively.

59. **(Original)** The set of detection probes of claim 56, wherein each of the first and second mass tag molecules is encapsulated within each of the first and second vesicle membranes, respectively.

60. **(Original)** The set of detection probes of claim 56, wherein each of the first and second mass tag molecules is adsorbed on each of the first and second vesicle membranes, respectively.

61. **(Original)** The set of detection probes of claim 56, wherein the mass tag molecules comprise at least a part of the vesicle membranes.

62. **(Original)** The set of detection probes of claim 56, wherein each of the first and second external vesicles further comprise at least one encapsulated vesicle, at least a part of the external and encapsulated vesicles comprising the mass tag molecule.

63. **(Canceled)**

64. **(Canceled)**

65. **(Canceled)**

66. **(Canceled)**

67. **(Canceled)**

68. **(Original)** The set of detection probes of claim 56, wherein the probes each comprise at least one molecule selected from the group consisting of chemical residues, polynucleotides, polypeptides, and carbohydrates.

69. **(Canceled)**

70. **(Original)** The set of detection probes of claim 56, wherein the first and second mass tag molecules are biopolymers.

71. **(Canceled)**

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72. (Currently Amended) The set of detection probes of claim 56, wherein the first and second mass tag molecules are synthetic polymers selected from the group consisting of block copolymers, polyethylene glycol, polyvinyl phenol, polypropylene glycol, polymethyl methacrylate, and derivatives thereof.

73. (Canceled)

74. (Original) The set of detection probes of claim 56, wherein the first and second mass tag molecules are amphiphilic molecules bound to a biopolymer or synthetic polymer.

75. (Canceled)

76. (Canceled)

77. (Original) A method of simultaneously assaying a plurality of different biological samples, each of said samples comprising a plurality of analytes, said method comprising:

immobilizing said analytes from each of said samples on a surface;
incubating said surface with the set of detection probes according to claim 56;
removing unbound detection probe;
collecting the first and second mass tag molecules from the bound detection probe; and
quantifying the first and second mass tag molecules collected.

78. (Original) The method of claim 77, wherein the binding of the detection probe results from the binding of molecules.

79. (Currently Amended) The method of claim 78, wherein the molecules are DNA, RNA, aptamers, proteins, peptides, polysaccharides, or chemical residues on biological molecules,or small chemical molecules.

80. (Canceled)

81. (Canceled)

82. (Canceled)

83. (Canceled)

84. (Original) The method of claim 77, wherein the mass tag molecules are collected after stimulation of the detection probes.

85. (Original) The method of claim 84, wherein the stimulation is a solvent change, chemical addition, pH change, agitation, sonication, heating, laser irradiation, light irradiation or freeze-thaw process.

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86. (Original) The method of claim 77, wherein the quantification method is selected from the group consisting of mass spectrometry, electrophoresis and chromatography.

87. (Original) A method of analyzing a plurality of different biological samples, each of said samples comprising a plurality of analytes, said method comprising:

labeling each sample with a detection probe according to claim 1, wherein the mass tag molecules of the detection probe labeling each sample have a different mass;

incubating the labeled sample with an immobilized target molecule capable of specifically binding to one of said analytes;

removing unbound labeled sample;

collecting the mass tag molecules from the bound probe; and

quantifying the mass tag molecules collected.

88. (Original) The method of claim 87, wherein the binding of the detection probe results from the binding of molecules.

89. (Currently Amended) The method of claim 88, wherein the molecules are DNA, RNA, aptamers, proteins, peptides, polysaccharides, or chemical residues on biological molecules, or small chemical molecules.

90. (Canceled)

91. (Canceled)

92. (Canceled)

93. (Canceled)

94. (Original) The method of claim 87, wherein the mass tag molecules are collected after stimulation of the detection probes.

95. (Original) The method of claim 94, wherein the stimulation is a solvent change, chemical addition, pH change, agitation, sonication, heating, laser irradiation, light irradiation or freeze-thaw process.

96. (Original) The method of claim 87, wherein the quantification method is selected from the group consisting of mass spectrometry, electrophoresis and chromatography.

97-116. (Canceled)